Abstract of the Disclosure

A bounding box or volume of interest is flooded with a modulated AC electromagnetic signal from a source. Different types of modulated signals may be used, including single-tone AM and FM. One or more sensors disposed on an object or body within the volume are then used to detect the signal, and a digital and/or analog spectral and phase analysis is performed on the received signal in hardware or software. The processing distinguishes between the direct source to sensor response and the response due to eddy currents. By removing the response due to the distorters, the effects of the electromagnetic distortion can be removed through a more conventional "free-space" solution. The invention finds applicability in a wide variety of environments, including head tracking systems and helmet-mounted displays for fighter aircraft; head trackers for armored vehicles; medical-guided surgery and biopsy; remote sensing, among other potential uses.